

Appln. No.: 10/643,097  
Reply to Office action of October 3, 2006

**REMARKS**

Claims 1-9 remain in this application.

**Claim Rejections Under 35 USC §103(a)**

Applicant respectfully believes the Examiner has failed to meet the burden of establishing a prima facie case of obviousness by rejecting claims 1 and 6-8 over Thorsrud (US Pat. No. 4,968,726, referred to hereafter as "the '726 patent") in view of the Encyclopedia of Polymer Science and Technology (1996), referred to hereafter as "Encyclopedia." Accordingly, Applicant believes the rejection should be withdrawn, and the claims allowed.

Claim 1 calls for a preparing mixture of PTFE resin powder and a susceptor material. Then, feeding the mixture into a compaction zone to at least partially compact and shape the mixture, and providing a continuous flow of the mixture from the compaction zone to a heating zone and heating and sintering the mixture within the heating zone by exciting the susceptor material by application of wave energy.

The Examiner acknowledges that the '726 patent fails to teach sintering PTFE. In contrast, the '726 patent teaches sintering ultra high molecular weight polyethylene (UHMWPE). Accordingly, the Examiner looks to the Encyclopedia to arrive at the conclusion that polyethylene (PE) and PTFE are equivalent alternate materials with respect to their capacity for radio-frequency heating, citing page 7 of the Encyclopedia, which shows that neither PE or UHMWPE responded to dielectric heating. With this, the Examiner reaches the conclusion that it would have been obvious for one of ordinary skill in the art to use PTFE as an equivalent to UHMWPE. With all due respect, this conclusion is flawed.

Rather than showing that PE and UHMWPE are equivalent materials with respect to their capacity for radio-frequency heating, what the Encyclopedia teaches is that both were non-responsive to dielectric heating under specific testing parameters. Other than stating that they were both non-responsive to dielectric heating, it does not teach, let alone suggest that they equivalent materials when it comes to dielectric heating potential. All the Encyclopedia shows, in addition to both PE and PTFE being non-responsive to dielectric heating under specific test parameters, is that PE has a loss index of 0.0008 and PTFE a loss index of 0.0004. Further, the Encyclopedia teaches that the ability to

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dielectrically heat a material is determined by a materials dielectric constant and its loss tangent, wherein the product of these two factors provides the above mentioned loss index. Accordingly, it can be concluded that the ability to dielectrically heat PTFE is twice as difficult. This is evidenced in the '726 patent, wherein it provides an equation,  $P=1.41(E/D)^2 \times f \times E''$ , where P is the power absorption in watt/in<sup>3</sup>, and E'' is the dielectric loss factor, also referred to as the loss index. Accordingly, with PTFE having half the loss factor of PE, it absorbs twice the power than PE. As such, these materials are far from being equivalent materials when it comes to dielectric heating potential. As such, Applicant contends that there is no teaching or suggestion within any of the references, whether considered separately or combined to arrive at Applicant's claimed method for fabricating PTFE material.

Accordingly, Applicant believes claim 1 to define patentable subject matter and to be in proper condition for allowance. Such action is respectfully requested.

Claims 6-8 are believed to define patentable subject matter over the '726 patent in view of the Encyclopedia for at least the same reasons stated above in support of claim 1. Accordingly, Applicant believes the rejection of these claims should be withdrawn, and the claims allowed. Such action is respectfully requested.

Applicant respectfully believes the Examiner has failed to meet the burden of establishing a prima facie case of obviousness by rejecting claims 2, 4 and 9 over the '726 patent in view of the Encyclopedia, and further in view of Dolan (US Pat. No. 5,646,192, referred to hereafter as "the '192 patent.") Accordingly, Applicant believes the rejection should be withdrawn, and the claims allowed. Such action is respectfully requested.

Claims 2 and 4 are dependent upon claim 1, while claim 9 is dependent upon claim 8. Claim 2 further includes drawing a vacuum on the mixture within a heating zone downstream from a compaction zone to extract air from the mixture, while claim 9 includes drawing a vacuum on the mixture during the sintering step to extract air from the mixture.

The Examiner acknowledges that the '726 patent and the Encyclopedia fail to teach drawing a vacuum during sintering. Accordingly, the Examiner turns to the '192 patent to arrive at the conclusion that drawing a vacuum during sintering is well known. However, the '192 patent does not teach drawing a vacuum during sintering, let alone during a sintering process which is downstream from a compaction process. Rather, the

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'192 patent teaches processing articles in a vacuum compression mold of a desired shape under a vacuum pressure under a compression pressure. Upon removal from the hot mold, the molded article can be cooled, then sintered (Col. 5, lines 7-20). In addition, the '192 patent teaches compression molding an article when a vacuum is drawn on the article. The compression molded (past tense) can be sintered. Again, there is no teaching or suggestion to draw a vacuum during a sintering process, let alone during a sintering process downstream from a compaction process.

Claim 4, being dependent upon base claim 1, is believed to define patentable subject matter and to be in proper condition for allowance for at least the same reasons.

Accordingly, Applicant believes claims 2, 4 and 9 to define patentable subject matter and to be in proper condition for allowance. Such action is respectfully requested.

Claim 3 is dependent on claim 2, and ultimately upon base claim 1, and thus, is believed to define patentable subject matter and to be in proper condition for allowance over the '726 patent in view of the Encyclopedia, and further in view of the '192 patent and Adams et al (US Pat. No. 4,375,441, referred to hereafter as "the '441 patent") for at least the same reasons stated above in support of claims 1 and 2. Accordingly, Applicant believes the rejection should be withdrawn, and the claim allowed. Such action is respectfully requested.

Claim 5 is dependent on base claim 1, and thus, is believed to define patentable subject matter and to be in proper condition for allowance over the '726 patent in view of the Encyclopedia, and further in view of the '441 patent for at least the same reasons stated above in support of claim 1. Accordingly, Applicant believes the rejection should be withdrawn, and the claim allowed. Such action is respectfully requested.

Applicant respectfully believes the Examiner has failed to meet the burden of establishing a prima facie case of obviousness by rejecting claims 1 and 5-8 over the '441 patent in view of the Encyclopedia and in further view of the '726 patent. Accordingly, Applicant believes the rejection should be withdrawn, and the claims allowed.

As previously stated in a prior Appeal Brief, in Adams et al., starting at Column 4, line 14, it is disclosed that the starting material have a sufficiently high "loss factor", also being referred to as "loss index" in the Encyclopedia, to be effectively heated with dielectric heat. In preferred embodiments, the starting materials are selected from polymers or polymer compositions having loss factors above about 0.08, preferably above

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0.2. Given that this teaching is far outside the reach of Applicant's teaching in Claim 1, the Examiner looks to the Encyclopedia. Again, as noted in a prior Appeal Brief, the Encyclopedia states that it is not possible to dielectrically heat PTFE using current state of the art equipment (pg. 8, last sentence of the first full paragraph). Table 2 of the Encyclopedia shows a listing of various materials with their associated "loss index" and corresponding "response to dielectric heating." The Examiner is reminded that PTFE has by far the lowest "loss index", half that of PE, which has a loss index of 0.0008, thus, making it the most highly improbable material listed to be dielectrically heated. And so, the Examiner looks now to the '726 patent which teaches that PE can be dielectrically heated, and states that the '441 patent and the Encyclopedia teach that PE and PTFE are equivalent alternative materials with respect to their capacity for radio-frequency heating because both resins cannot be heated by radio-frequency energy. For reasons already stated above, Applicant believes this conclusion to be without merit. How is it that PE, with a loss factor of 0.0008, and PTFE, with a loss factor of 0.0004, can be equivalent alternative materials with respect to their capacity for radio-frequency heating? As noted above, the '726 patent discloses an equation,  $P=1.41(E/D)^2 \times f \times E$ ", where E" is the dielectric loss factor. Accordingly, with PTFE having half the loss factor of PE, it absorbs twice the power than PE. As such, these materials are not equivalent materials when it comes to dielectric heating potential.

Accordingly, Applicant believes claim 1 to define patentable subject matter and to be in proper condition for allowance. Such action is respectfully requested.

Claims 5-8 are believed to define patentable subject matter over the '441 patent in view of the Encyclopedia and in further view of the '726 patent for at least the same reasons stated above in support of claim 1. Accordingly, Applicant believes the rejection should be withdrawn, and the claims allowed. Such action is respectfully requested.

Applicant respectfully believes the Examiner has failed to meet the burden of establishing a prima facie case of obviousness by rejecting claims 2-4 and 9 over the '441 patent in view of the Encyclopedia and in further view of the '726 patent and the '192 patent.

For at least the same reasons stated above in support of Claims 2-4 and 9, Applicant believes this rejection should be withdrawn, and the claims allowed. In particular support of Claims 2 and 9, none of the references teach, let alone suggest

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drawing a vacuum during the sintering process. Accordingly, Applicant believes these claims define patent subject matter and to be in proper condition for allowance. Such action is respectfully requested.

The Patent Office is authorized to charge or refund any fee deficiency or excess to Deposit Account No. 04-1061.

Respectfully submitted,

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Nov. 8, 2006  
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**CERTIFICATE OF MAILING**

I hereby certify that this Amendment is being deposited with the United States Postal Service via facsimile 571-273-8300 addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on November 8, 2006.

  
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